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# Department of Labor

**Occupational Safety and Health Administration**

**Servicing Multi-Piece Rim Wheels; Proposed Rulemaking**

**DEPARTMENT OF LABOR**

**Occupational Safety and Health Administration**

**[29 CFR Part 1910]**

**Servicing Multi-Piece Rim Wheels**

**AGENCY:** Occupational Safety and Health Administration, U.S. Department of Labor.

**ACTION:** Proposed standard.

**SUMMARY:** The Occupational Safety and Health Administration (OSHA) is proposing a new standard, 29 CFR § 1910.177, for the servicing of multi-piece rim wheels fitted on vehicles used on and off highways.

The proposed standard will regulate servicing of multi-piece wheels, thereby reducing the number of fatal and serious injuries to employees. These wheels consist of two or more detachable rim components and tube-type tires sixteen inches or larger in diameter which are used on motor vehicles, such as trucks, trailers, buses and mobile homes, for either on-highway or off-highway usage. The major hazard is that of an employee being struck by a wheel component which has been thrown from an inflated wheel during an unintended explosive separation.

This proposal includes requirements for training of all tire servicing employees, establishment of a safe practice procedure for servicing multi-piece rim wheels, mandatory use of restraining devices and criteria for interchangeability of rim components.

**DATES:** Written comments on these proposed rules must be postmarked by July 6, 1979. A public meeting will be held on June 19, 1979. Persons wishing to speak at the meeting should notify OSHA by June 12, 1979. Requests for a hearing must be received by July 6, 1979.

**ADDRESS:** Comments, notifications and hearing requests shall be sent to: Docket Officer, Docket No. S–005, Room S–6212, U.S. Department of Labor, Washington, D.C. 20210, (202) 523–7894.

To assist interested persons in submitting their written comments and data, OSHA is scheduling a public meeting during the comment period. The meeting will be held on Tuesday, June 19, 1979, in Room S–4215 A, B and C, Department of Labor, 200 Constitution Avenue, N.W., in Washington, D.C. It will begin at 9:00 a.m., will recess from 12 noon to 1 p.m., and will continue until 5 p.m.

**FOR FURTHER INFORMATION CONTACT:** Mr. John J. Klocko, Jr., Project Officer, Occupational Safety and Health Administration, Room N–3506, U.S. Department of Labor, Washington, D.C. 20210, Telephone: (202) 523–7213.

## I. Background

### *A. Introduction*

OSHA concern for developing a standard with appropriate requirements for the safety of employees engaged in servicing multi-piece rim wheels was initiated by an internal report of "Hazards Not Covered by a Standard" from OSHA field personnel at the Louisville, Kentucky office. This was followed by a second similar report from OSHA field personnel in Columbus, Ohio.

Since the review of these reports, OSHA has monitored reports of accidents and injuries related to multi-piece rim wheels. The May 1974 issue of "Learn and Live," a monthly publication of the Industrial Safety Division of the Florida Department of Commerce, reported that the fatality toll in Florida from servicing multi-piece rims had risen to 11 over a period of ten and one half years and by the end of 1978, the toll had risen to 15.

Petitions for the promulgation of a standard relating to the servicing of multi-piece rim wheels were submitted to OSHA in 1976 by the Rubber Manufacturers Association (RMA) and the Firestone Tire and Rubber Company. The National Highway Traffic Safety Administration (NHTSA), U.S. Department of Transportation (DOT) supports the promulgation of such a standard and has by written request urged OSHA to regulate the servicing of multi-piece wheels in the workplace.

### *B. Multi-piece Rims*

Multi-piece rims are used in conjunction with tube-type tires with rim diameters of sixteen inches or greater. Trucks, tractors, buses, trailers, campers and off-highway vehicles utilize multi-piece rims when outfitted with tube-type tires. Multi-piece rims range from two or three piece assemblies used by trucks, buses and trailers, to five and six piece assemblies for large off-the-highway vehicles.

A multi-piece rim consists of a rim base, the largest part of the metal structure supporting the tire, and one or more detachable side rings serving as a flange to keep an inflated tire on the rim base. A rim base, side ring, lock ring, and tire are collectively referred to as a "wheel." for multi-piece rims, side rings are the prime components which support the tire's bead. This is referred to as a split side ring in two piece assemblies and a solid side ring and split lock ring in three piece assemblies. In the case of two piece circumferentially continuous components, the outer small component is termed a "side ring." (See Society of Automotive Engineers SAE J393 which defines rim terminology.)

There are basically four multi-piece wheel designs. In the first design (exemplified by Goodyear's "KW" type rim) the rim base is split radically and the side ring is circumferentially continuous. In the second design (exemplified by Firestone's, Kelsey's and Budd's "RH5°" and "KL" rims) both the wheel and the side ring are circumferentially continuous. The third type rim (exemplified by Goodyear's "LW" type rim) is a two piece assembly composed of a demountable rim base and a split side ring or a wheel and a split side ring. The fourth design in the larger sizes (exemplified by firestone's commander 5° rim) is a three piece assembly composed of a wheel and a side and lock ring.

### *C. Hazards*

Although accidents may occur at any time when handling multi-piece rims, the primary danger involves the process of inflating the tire. If the rim's components are not assembled properly, the force that results from the inflation can cause the rim to blow out from the tire and possibly strike an unprotected employee, inflicting serious injury.

An inflated tire is a high pressure vessel, e.g., a popular size 10.00 x 20 tire when inflated at 105 psi creates a force in excess of 40,000 pounds against the rim flange. This force, according to test data provided by the Insurance Institute for Highway Safety (IIHS), accelerated a locking ring to 130 mph and raised a 215 pound anthropomorphic dummy 10 feet vertically upward from a wheel resting horizontally on the pavement.

The principal hazard with mounting, installing, storing, and handling wheels, rims, tires and their parts is present when they are assembled together and the unit is inflated to required pressure or beyond. If a component is not set or seated in its proper position in relation to the other components, the rings or removable flanges may separate violently from the assembly. Such separation may cause lock rings, rims, or other fastenings to be hurled violently through the air, with the likelihood of striking a person and causing serious injury or death. Such accidents are most likely to occur while a tire that has just been mounted on a rim is being inflated or immediately after it has been inflated.

Accidents that have caused the greatest number of injuries appear to

have been due to improper mounting, use of damaged parts, or mismatch of component parts. Accidents may also occur because of overinflating the tire or striking the lock rings or rims with a hammer.

*D. Accident Data*

Incidents which result in a serious or fatal injury to a mechanic engaged in servicing a multi-piece rim wheel often are only reported locally. Therefore, the data available is limited to only a portion of the total injuries and fatalities which occur. In May 1974, the Florida Department of Commerce, in its monthly publication, reported an average of one fatality each year in the State over the previous eleven years as a result of employees servicing multi-piece rim wheels.

On September 28, 1973, the NHTSA's Office of Defects Investigation (ODI Case No. 215) issued a report on its investigation of multipiece rim failures. This report covered 29 accidents due to improper assembly procedures that resulted in serious injury or a fatality, involving KB and KW type wheels. The report indicated that many of the shop personnel who worked with the multi-piece rims in question may not have been aware of all safety precautions to be followed when mounting or demounting these wheels.

On December 21, 1973, NHTSA issued a report on its investigation of RH5° wheel failures (ODI Case No. 150) that included investigation of 81 incidents which resulted in serious injury or fatality to employees engaged in servicing these wheels. This report recommended several courses of action which included discontinuance of the manufacture of this type of wheel; development and distribution of a poster illustrating the safety precautions to be used during multi-piece rim wheel assembly; and development and distribution of a matching chart showing the compatibility of parts of multi-piece rim wheels produced by different manufacturers. Both the safety precautions chart and the multipiece rim/wheel matching chart, which were developed by NHTSA after the report was issued, are collectively referred to in this proposal as the "DOT wall charts."

NHTSA is currently investigating the safety hazards and benefits associated with use of multi-piece rims. They have issued an advance notice of proposed rulemaking on March 5, 1979 (44 FR 12072) to determine whether to require certain performance levels for tire and rim component retention and whether to ban the production of multi-piece rims.

NHTSA's actions are not directed at working conditions of employees and therefore are not an exercise of statutory authority by a Federal agency which would preempt action by OSHA under § 4(b)(1) of the OSH Act. NHTSA's intent not to displace OSHA's coverage of tire-servicing personnel is articulated by that agency's recognition that numerous accidents occur because of improper servicing, coupled with NHTSA's formal request that OSHA promulgate a standard for servicing of multi-piece wheel rims in the workplace.

OSHA's Office of Management Data Systems and Statistical Coordination received information from state worker's compensation reports on ten fatal accidents involving servicing of multi-piece rim wheels which occurred during 1976 and 1977.

Data supplied by RMA which is listed in Table 3–2 of the Regulatory Assessment Statement indicates that fatalities represent 13% of all multi-piece rim accidents, injuries represent 63% and property damage and no-injury accidents represent the remaining 24% of the 165 cases reported for the years 1972–1975. The Insurance Institute for Highway Safety (IIHS) data indicates that fatalities represent 18%, injuries 67% and property damage and no-injury accidents represent the remaining 15% of the 241 cases reported for the years 1968–1977. Neither data base is considered representative of the nation because the actual number of split-rim accidents is not ascertainable nor can the annual frequency of occurrence be predicted with a high degree of accuracy. Since the reported accidents do not represent a statistical sampling, but are only cases known to each organization, the above listed values are being used as a lower limit of accident exposure.

A review of accident descriptions provided by the Insurance Institute for Highway Safety indicates that 53% of accidents under OSHA jurisdiction occurred while the tire was being mounted/demounted, 31% while the wheel was being installed/removed and the remainder (16%) when the wheel was being handled or moved. Two percent (i.e., 5) of the 241 accidents that were evaluated, occurred while a safety cage or restraint was being used. A breakdown of the 16% category indicates that numerous accidents occurred while moving an inflated tire in the service area, measuring tire pressure, removing the valve core or simply while storing an inflated tire at rest. In some cases, multi-piece wheels exploded and injured or killed experienced tire service personnel working on them at the time. However, it would appear that in many cases, the employees had never received any training nor had they ever been apprised of the inherent hazards and the safety practices to be followed.

Although the presented values may not be statistically representative of all multi-piece wheel accidents, they provide an insight into the relative order of magnitude of fatalities and injuries. The severity of injuries has not been classified into defined categories, but an examination observation of IIHS accident briefs suggests the existence of a higher than expected proportion of fatalities and sever injuries, including many permanent disabilities.

*E. Present Regulations*

At present, there are no specific OSHA general industry standards that apply to the handling and servicing of multi-piece rims. In the construction safety and health standards, § 1926.600(a)(2) requires only that a tire rack, cage, or equivalent protection be provided and used when inflating tires or multi-piece rims or rims equipped with locking rings or similar devices. Section 1926.600 would not be affected by this proposal.

**II. Major Issues**

During the research and formulation phases of this proposal, the Office of Mechanical Engineering Standards has concluded that safety practices and procedures which are currently in effect for multi-piece wheels are fairly general in nature. More precise safety criteria may be helpful in developing the final regulation. Accordingly, OSHA invites public comment on the following issues as well as the other issues raised by this proposal.

(1) *Whether training is an effective method to reduce accidents associated with multi-piece rims and what training should be required?* Proper training and demonstrated servicing ability would be required by the proposal before an employee would be permitted to service multi-piece wheels. A review of accident data, petitions and correspondence to OSHA indicates that tire mechanics simply do not understand the potential lethal effects associated with multi-piece wheel repair nor are they aware of recommended safe operating practices.

The content of training material required by the proposal would include, but not be limited to, that which is contained in the DOT wall charts. The adequacy of material on the charts as an effective training aid and availability of additional sources of information must both be assessed for establishment of

training requirements. OSHA solicits information as to appropriate materials for training employees to service multi-piece wheels and methods of providing such training.

Public response is solicited as to whether training is considered a feasible method to reduce hazards and whether the approach stated in the employee training section of the proposed standard is considered adequate to achieve these results.

(2) *Whether a restraining device should be required from the time of inflation to the time of installing a wheel on a vehicle?* Installation or removal of a wheel on/off an axle is another safety hazard, especially the removal of a wheel that has been driven while underinflated. Also, the handling of inflated wheels outside of restraining devices or those stored within the service area presents a potential hazard to tire mechanics. In these situations, lock rings may be latched in an improper position, and if bumped or jolted, they are susceptible to being trajected from the rim base.

A crucial issue is how to reduce the number of injuries which happen from the time that the wheel is removed from the restraining device until it is installed on the vehicle. Even though the use of a restraining device from the time that a tire is inflated to the time that the vehicle weight is placed on the tire would prevent many of the serious accidents, OSHA believes that such a practice is not feasible, and is not proposing it as a requirement.

If restraining devices are to be required when installing, removing or handling an inflated tire and wheel, what types of devices are available, will they interfere with the vehicle body and are other safety techniques known to eliminate the potential hazards? The agency solicits data and information on the need for ring containment during the entire time of servicing and the practicality of this concept.

(3) *What different types of restraining devices are currently available?* Cages are considered to be the most popular and versatile type of restraining device in use: however, OSHA wants to determine what other types of restraining devices are available, commonly used and considered to be as reliable as a cage. Do any factors other than cost and portability influence the decision to purchase or use a specific type? Of concern to OSHA are those types of devices that should not be used or those specific circumstances under which their use should be prohibited.

Whether a sufficient number of devices will be commercially available on the effective date for compliance with this regulation is another concern. Have any patents been granted that will control or restrict widespread production of a specific design or safety feature? Do fixed restraining devices have an advantage over portable units or can they be interchanged without significantly altering employee protection? In essence, OSHA's proposed requirement for the construction of a restraining device is that the device constrain wheel components in the event of an explosive separation. To fulfill this requirement, what criteria for cage configuration is advocated for use as an industry-wide standard?

(4) *Whether strength requirements for restraining devices should be specified?* The proposal requires use of a restraining device when inflating a tire within a service area. If strength requirements for such a restraining device are to be specified, one must determine the force or the actual energy that will be transferred to a cage for each tire size. OSHA is requesting information about the current methods being used by manufacturers to determine the fraction of energy being transferred to the restraining device.

It is anticipated that various manufacturers will begin production of newly designed equipment and that home-made units will be fabricated to meet the requirement for restraining devices. To assure that restraining devices are of adequate strength, OSHA solicits data as to those design specifications and structural requirements currently in use by manufacturers that could serve as a national standard.

Some restraining devices could be designed to function within the plastic range of the stress-strain curve during a wheel separation. Should continued use of such devices be permitted after the initial permanent deformation, and if so, what degree of deformation is acceptable? Also, what criteria should be used to determine when a deformed device should be removed from service? OSHA believes that some strength requirements and other parameters are essential to assure reliable operation and solicits public response.

(5) *Whether hydraulic lift hoist rails can be considered an adequate restraining device?* Since hydraulic lifts are readily available in most tire repair shops, the hoist rails obviously are available for use as a restraining device when lowered directly over a wheel resting on the floor. The National Safety Council (Data Sheet No. 411) has recommended their use as a viable restraining device; however, OSHA questions their adequacy since the hoist must be properly positioned to serve this function safely. If the hoist is resting on the rim base, the lock ring of certain rims cannot become properly seated, thereby causing a safety hazard. Likewise, if the hoist is too high or not centered over the wheel, the lock ring motion may not be controlled during an actual separation. Also, the spacing between the hoist rails must be less than the outside diameter of the lock ring in order to restrain flying wheel components. Specific criteria are required to establish the effectiveness of using a hoist as a restraining device. OSHA requests data and information on the extent to which hydraulic lifts are used for this purpose along with data as to their effectiveness and safety. Even though the use of hoist rails as a restraining device is not mentioned in the proposal, should its use be prohibited?

(6) *When should a rim component be removed from service?* Damaged, bent, worn or corroded rim bases and rings are often claimed as the cause of wheel separations. The determination of component quality is currently a subjective judgment made by the mechanic inspecting a wheel during assembly. The primary concern is the availability of specific guidelines so that a mechanic can make an objective, rather than subjective, decision when confronted with a potential problem during inspection. Specific criteria for the twist of a sprung split ring, the amount of surface rust and corrosion on lip and gutter surfaces and the amount of wear on lip and gutter surfaces will be beneficial to determine when a rim component can be used. To accomplish this end, OSHA requests data and information that can be useful for establishment of objective requirements to determine when a rim component should be removed from service.

(7) *Whether or not the information in DOT Wall Charts should be posted or simply be available to tire mechanics?* Information contained in DOT Wall Charts is essential for understanding safe operating practices for servicing multi-piece wheels. OSHA proposes that this information be available in the service area. The wall charts are available free from the NHTSA to persons servicing multi-piece wheels, or for a small fee, they are available to establishments from the Government Printing Office (GPO). (See Appendix B.)

OSHA wishes to determine whether there are other sources which provide the information on the wall charts, such as booklets, plastic coated cards, other

posters, charts or different formats. OSHA also wants to know whether shops currently using this instructional material have a preference for a particular form. Finally, is the posting of charts for easy observation more effective than simply having the information available for reference in the service area?

(8) *Whether a warning label for multi-piece rims should be specified?* Section (6)(b)(7) of the Occupational Safety and Health Act of 1970 addresses ". . . the use of labels or other appropriate forms of warning . . ." associated with employee exposure to hazards. Lock rings, side rings and rim bases, because of their size and operational use, do not lend themselves well for labeling. The manufacturer's name, size, type of rim and manufacturing date are presently required to be on each multi-piece rim in accordance with Federal Motor Vehicle Safety Standard 120. This information is imprinted into the metal components; however, due to rust and mud the legibility is reduced commencing with use of the wheel. Rim manufacturers claim that stamping letters into rim components creates stress raisers, a hazard in itself and recommend that the imprinting of rim components be minimized. Is there an alternative to labeling or imprinting as a means of informing the user of the relevant hazards?

Labels containing appropriate warning are usually affixed to equipment containing the hazard. Assuming that a label or warning cannot be fastened to a rim component, should it be affixed to the restraining devices, or perhaps on a separate chart posted for visual reference within the service area? Is the warning statement contained on the DOT wall chart considered to be sufficient notice of the hazards? OSHA solicits comments on the need for a warning label, the contents of the label and the recommended location for its placement.

(9) *Whether inflation of a wheel mounted on an axle should be permitted?* Inflating an installed wheel which has been driven while flat or severely underinflated is potentially dangerous. Some consider it so dangerous that they advocate removal of the wheel from the vehicle for inflation within a restraining device, while others consider inflation of the wheel on the vehicle to be perfectly safe when proper precautions are taken. Inflation of the wheel on the vehicle, while using a clip-on chuck attached to the valve stem and a sufficient length of hose to permit the attending mechanic to stay clear of the trajectory path, provides safety for the mechanic but may be a hazard for others. If the mechanic inflates the wheel only when no one is in the trajectory path, the hazard will be eliminated. Is this approach reasonable; if not, what other method is recommended?

**III. Summary and Explanation**

(A) *Proposed Rule.* The proposed rule is subdivided into six categories: scope, definitions, employee training, tire servicing equipment, wheel component acceptability, and safe operating procedures. The following summary will provide an explanation and discussion of the requirements of this proposed safety standard.

(1) *Scope.* The proposed regulation is intended primarily for the protection of employees engaged in repair of split rim wheels used on trucks, buses or other large vehicles. It will also apply to the service and maintenance of all multi-piece vehicle wheels whether used in construction, agriculture, maritime or general industry. The proposed standard, however, would only apply to employees performing the repair in workplaces covered by Part 1910.

A review of rim specifications indicates that all rims using a split ring have at least a 16" nominal diameter. The proposal reflects this finding by covering only rims 16 inches or greater in nominal diameter. It is hoped that this will eliminate the potential for misapplying this regulation to the smaller wheels used on automobiles, boat trailers, utility trailers, vehicles with solid tires or other multi-piece rims not using lock rings.

(2) *Definitions.* The definitions are stated as commonly used in the tire industry; however, some have been modified slightly to accommodate the regulatory nature of this proposal.

Throughout the relevant literature, the term "mounting" has two different meanings. In one case, "mounting" a tire means assembling a tire with an appropriate rim and tube, while in the other case it means attaching a wheel to an axle. A review of nationwide accident reports indicates that the word "mounting" is used in both senses throughout the United States. For the purposes of this proposal, OSHA will use the terms "mount and demount a tire" to mean the assemblage and disassemblage of a wheel. "Install and remove a wheel" means the attachment and removal of a wheel to/from a vehicle axle hub. This choice of definitions lessens the possibility of confusion associated with the "demounting a tire" vs. "dismounting a wheel" usage, while still conforming to NHSTA and tire manufacturer terminology. The term "dismounting" will not be used in this proposal but will be replaced with "removal." OSHA solicits public comments on this choice of terminology.

(3) *Training.* The proposal would require every employee who services multi-piece rim wheels to be trained in proper techniques and practices applicable to this type of wheel. Training would be required because many tire mechanics simply do not understand the potential danger involved in servicing split rims. The need for training is substantiated by a review of accident cases in which there appears to be a lack of knowledge of safe operating practices. Additionally, the majority of petitioners have requested a training requirement.

OSHA considers that training, in conjuction with the use of a restraining device and clip-on chuck, can be an effective technique contributing significantly to a reduction of accidents.

This proposal does not specify the training program contents but simply requires continuous employee proficiency in given elements of servicing. A mechanic's level of proficiency can be evaluated by demonstration of his familiarity and demonstrated ability relative to information contained in the DOT wall charts. By requiring a level of acceptable proficiency to be attained, the proposed standard can be stated in performance language, thus providing flexibility for the employer in achieving the desired end result. This technique places the burden of providing adequate training and evaluation solely on the employer Employees are adequately trained if they have thorough knowledge of and can apply the information contained in the DOT wall charts and this OSHA regulation.

(4) *Tire servicing equipment* The unintended explosive separation of a lock ring from its rim base is the primary cause of all occupational accidents associated with multi-piece wheels A majority of the accidents under OSHA jurisdiction have occurred while the tire was being inflated following assembly Accordingly, a significant reduction of injuries can be attained through use of a device specifically designed to protect mechanics from lethal airborne wheel components. An accepted practice for employee protection is to use a cage surrounding the wheel in such a manner as to prevent any wheel component from being hurled beyond the cage boundaries. The proposal would require mandatory use of a restraining device while inflating a tire off the vehicle.

except that a tire may be inflated to ten psig without a restraining device for the purpose of seating the wheel components. So as not to limit innovation, OSHA proposes to permit use of machinery or equipment other than cages which will also constrain an entire wheel and prevent any component from striking an employee regardless of wheel position within the device.

Inflation of tires installed on vehicles presents another major safety hazard. Because of the impracticality of using restraining devices on installed wheels, equivalent safety can be attained by use of equipment which permits the attendant to be clear of the possible trajectory path of each wheel component.

Due to the magnitude of forces associated with a sheel separation, strength requirements for restraining devices are being proposed. Specifying these requirements necessitates knowing the amount of potential energy stored in the compressed air of a tire that will be transferred to the restraining device during a separation. For example, an analysis of high speed film in which the rim base gutter cone angle was machined to favor an explosive separation indicated that 8,200 ft.-lbs. of energy was released when a 10.00 x 20 test tire was inflated to 105 psi. Calculations of the toal pneumtic energy in the tire indicated 75,000 ft.-lb. of available potential energy. After the energy transfer is determined, selection of an appropriate factor of safety will lead to a properly designed restraining device.

OSHA proposes that the generally accepted minimum factor of safety, 1.5 for machinery, be used for the largest wheel that the device can hold. Not only does it provide a larger margin of safety for smaller wheels inflated within the same device, it also provides flexibility for users who assemble single size tires.

The proposal would prohibit the use of restraining devices with cracks in welds or components. Cracks in welds or equipment components are undesirable stress raisers which may cause equipment failure when subjected to dynamic loading. The factor of stress concentration for some cracks may exceed the 1.5 factor of safety. Therefore, if a cracked member of a restraining device is loaded to its design value, the apex of the crack may become overstressed and enlarged.

The availability of current wall charts and rim manuals will assure ready reference for tire mechanics encountering unusual situations or rim matching problems. The only way to assure availability of the charts and manuals to mechanics performing the work, is to require their presence in the workplace, thus providing the mechanics with information necessary to safely accomplish their task.

(5) *Wheel component acceptability.* The proposal would require that wheel and rim components not be interchanged between different manufacturers' wheel models, except as provided on the DOT Multi-Piece Rim/Wheel Matching Chart.

Whenever the side or lock rings are bent out of shape, corroded or broken, the proposal would require that they not be used and that they be removed from the service area.

Any rim component containing visible cracks would be prohibited from use and would have to be disposed of. The mating surfaces of the rim gutter, rings and tire must be free of any surface rust, scale or rubber build-up prior to assembly and inflation.

OSHA believes that adherence to these procedures will significantly reduce the potential hazard in servicing multi-piece rims.

(6) *Safe operating procedures.* The safe operating practice provisions of this proposal would require that every employer instruct all his employees engaged in servicing multi-piece wheels in the practices and procedures prescribed in these standards, which are those recommended on the basis of industrial experience. These procedures are described below.

Before a wheel is removed from the vehicle axle or before the wheel is demounted, the tire shall be completely deflated. On dual wheel assemblies, both tires shall be deflated before removing a wheel from the axle to avoid any violent disturbance of the assembly.

Before assembly and inflation of the wheel and tire, a rubber lubricant shall be applied to the bead and rim mating surfaces to reduce sliding friction.

After a tire has been inflated in a restraining device and while the tire is still so protected, the tire, rim and ring(s) shall be inspected to make sure they are properly seated and locked. If it is determined that further adjustment work on the rim or ring(s) is necessary, the tire must be deflated before proceeding on any adjustment. Under no circumstances shall any attempt be made to adjust the seating of the side and lock ring(s) by hammering, striking or forcing the components while the tire is inflated, so as to avoid any violent separation.

Tires that are being serviced off the vehicle shall be inflated to desired specification pressure while still contained in the restraining device. Tires may be inflated to not more than 10 psig outside the restraining device for the sole purpose of seating the tube, flap, tire and lock rings. For pressures at or below 10 psig, the danger of an explosive separation is minimal. The low risk of injury during the seating process must be compared to a higher risk of injury due to an explosive separation if the rings are not properly seated. When a tire is placed into a restraining device, the lock rings may slip out of the gutter, thus, setting the stage for subsequent explosive separation. Therefore to assure proper setting of lock rings, OSHA would permit tires to be partially inflated outside of a restraining device.

If a tire explodes within the restraining device, the suddenly applied force exerted against the frame will immediately be transferred to the object or person resting against it. Except for containment of the exploding wheel components, the effects of the force upon the person or object leaning against the frame will be almost as severe as if the frame was not present. This process can be compared to a pool ball being hit by a fast moving cue ball. The energy of the rings is transferred to the tool, object or person leaning against the restraining device. Under no circumstances shall any tire mechanic lean himself or any tool against the restraining device during tire inflation.

Whenever any part of a rim base, rings or lugs is to be subjected to a high temperature heat source, such as from a welding or brazing torch, the tire must be completely deflated. Heat applied to the metal components increases the air pressure in the tire and may produce a sudden unintended separation.

Whenever inflated wheels are being moved or temporarily stored in a service area, they shall be positioned so that the possible trajectory path of a lock ring will not pass through the service area which normally may be occupied by service personnel.

## IV. Regulatory Assessment Statement

In accordance with Executive Order No. 12044 (43 FR 12661, March 24, 1978), OSHA has assessed the potential economic impact of this proposal. Based on the economic identification criteria followed by the Department of Labor (44 FR 5570, January 26, 1979), OSHA has concluded that the subject matter of this proposal is not a "major" action which would necessitate further economic impact evaluation and the preparation of a Regulatory Analysis.

This determination is based on a June 29, 1978, report by Centaur Management

Consultants, Inc. The major findings of the "Economic Impact Statement/ Assessment for Multi-Piece Rim Assemblies" include:

—The population at risk is approximately 322,000 persons. These persons are employed in 102,500 workplaces in ten industry segments. These persons will benefit from a safer workplace as a result of the standard.

—From 1968 to 1975, the wheel and rim industry reported a total of 295 injuries resulting from multi-piece rim accidents. A minimum of 22 fatalities resulted from these accidents.

—Provisions of the standard resulting in economic impact include the use of restraining devices, clip-on-chuck assemblies and training.

—Capital costs resulting from compliance with the standard total $8,342,000. Total annualized costs including capital and training costs are estimated to total $3,810,000.

—Cost, productivity, employment, critical materials, energy and market structure impacts were examined. No significant impacts on any of these areas were found to result from compliance with the standard.

Based on estimated sales of restraining devices over the past 10 years, 24% of stationary workstations presently use cages or racks and 72% of mobile workstations presently use portable safety racks. It is estimated that those establishments currently using restraining devices also use clip-on-chucks with in-line valves. Therefore, approximately 77,700 establishments will have to purchase at least a $134 cage and a $21 clip-on-chuck for compliance with this standard. Wall charts and rim manuals are free to tire assemblers; consequently, only administrative costs are involved in their acquisition. The cost of training employees should not exceed an hour of employee time plus corresponding instructor time.

The major benefit to be attained by complying with this regulation is a significant reduction in the number of fatalities and permanent injuries which occur while servicing multi-piece rim wheels each year.

The benefit derived from using the proposed training technique is that it is applicable to both experienced employees and new hires; and flexible as employers may choose to conduct group training classes rather than individual instruction. In general, increased productivity, reduced insurance premiums, reduced workers compensation payments and fewer product liability suits can be expected through compliance with this standard.

The regulatory assessment is available for inspection and copying at the U.S. Department of Labor Building, OSHA Docket Office, Room S–6212, 200 Constitution Avenue, N.W., Washington, D.C. 20210. OSHA invites comments concerning the conclusions reached in the economic impact assessment.

## V. Public Participation

Interested persons are invited to submit written data, views, and arguments with respect to this proposal. These comments must be postmarked on or before July 6, 1979, and submitted in quadruplicate to the Docket Officer, Docket No. S–005, U.S. Department of Labor, 3rd Street and Constitution Avenue, N.W., Room S–6212, Washington, D.C., 20210. Written submissions must clearly identify the provisions of the proposal which are addressed and the position taken with respect to each issue.

The data, views, and arguments that are submitted will be available for public inspection and copying at the above address. All timely written submissions received will be made a part of the record of this proceeding.

To assist interested persons in submitting their written comments and data, OSHA is scheduling a public meeting during the comment period. The meeting will be held on Tuesday, June 19, 1979, in Room S–4215 A, B and C, Department of Labor, 200 Constitution Avenue, N.W., in Washington, D.C. It will begin at 9:00 a.m., will recess from 12 noon to 1 p.m., and will continue until 5 p.m.

The public meeting is intended as an informal forum for interested persons to present their concerns orally and to seek clarification of the proposal from representatives of OSHA who will conduct the public meeting.

OSHA requests that any person wishing to make an oral presentation at the meeting notify OSHA in advance. Please identify the person and/or organization intending to make a presentation, telephone number, the amount of time requested for that presentation, and the subject matter and a brief summary of the intended presentation, if possible. This written notice should be sent to Docket S–005, Docket Office, Rm. S–6212, U.S. Department of Labor, 3rd Street and Constitution Avenue, N.W., Washington, D.C. 20210 no later than June 12, 1979. All persons giving advance notice will have time reserved for their oral presentations. Persons wishing to speak who have not filed advance notices are requested to register from 8:30 a.m. to 9:00 a.m. on the morning of the public meeting.

As long as time permits, all persons who wish to be heard will be allowed to speak. However, in the interest of time, persons who have provided advance notice will be given priority.

Detailed minutes of the meeting will be prepared and will be made a part of the record of this rulemaking. Copies of the minutes will be available for inspection at the OSHA Docket Office, Room S–6212, U.S. Department of Labor, 3rd Street and Constitution Avenue, N.W., Washington, D.C. 20210.

Pursuant to 29 CFR 1911.11(b) and (c), interested persons may, in addition to filing written submissions and attending the public meeting as provided above, file objections to the proposal and request an informal public hearing with respect thereto in accordance with the following conditions:

(1) The objections must include the name and address of the objector;

(2) The objections must be postmarked on or before July 6, 1979, and submitted to the Docket Office at the above address;

(3) The objections must specify with particularity the provisions of the proposed rule to which objection is taken, and must state the grounds therefor;

(4) Each objection must be separately stated and numbered; and

(5) The objections must be accompanied by a detailed summary of the evidence proposed to be adduced at the requested hearing.

## VI. Authority

This document was prepared under the direction of Eula Bingham, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, Third Street and Constitution Avenue, N.W., Washington, D.C. 20210.

Accordingly, pursuant to section 6(b) of the Occupational Safety and Health Act of 1970 (84 Stat. 1593; 29 U.S.C. 655) Secretary of Labor's Order No. 8–76 (41 FR 25059), and 29 CFR Part 1911, Part 1910 of Title 29, Code of Federal Regulations is proposed to be amended by adding a new § 1910.177 as set forth below.

Signed at Washington, D.C., this 19th day of April 1979.

Eula Bingham,

*Assistant Secretary of Labor.*

Part 1910 of Title 29 of the Code of Federal Regulations is proposed to be amended by adding a new § 1910.177 to read as follows:

**§ 1910.177 Servicing and repairing of multi-piece rim wheels.**

(a) *Scope.* This section applies to the servicing of vehicle wheels containing multi-piece rims sixteen inches or larger in diameter.

(b) *Definitions.* "Installing a wheel" means the transfer and attachment of an assembled wheel onto a vehicle axle hub. Removing means the opposite of installing.

"Mounting a tire" means the assembly or putting together of rim components, tube, liner (flap)) and tire to form a wheel, including inflation. Demounting means the opposite of mounting.

"Multi-piece rim" means a vehicle wheel rim consisting of two or more parts, at least one of which is detachable, designed to hold the tire in place on the rim.

"Restraining device" means a mechanical apparatus such as a safety cage, rack or safety bar arrangement that will constrain all multi-piece rim wheel components within the device following their release during an explosive separation of the wheel.

"Rim manual" means a publication containing instructions from the manufacturer for correct mounting, demounting, maintenance and safety precautions peculiar to the multi-piece rim being serviced.

"Service or servicing" means the mounting, demounting, inflation, installing, removing, maintaining, repair, handling or storing of multi-piece rim wheels and inflation and deflation of wheels installed on vehicles.

"Service area" means that part of an employer's premises customarily or routinely used for the servicing of multi-piece rims.

"Trajectory path" means a route or curve that a lock ring, side ring, rim base or tire will travel as it is hurled from the rim base during an explosive tire separation. The components can be expected to depart nearly perpendicular to their assembled position on the rim base at time of separation. (See Appendix A for examples of trajectory paths.)

"Wall Charts" means the United States Department of Transportation, National Highway Traffic Safety Administration (NHTSA) publication entitled "Safety Precautions for Mounting and Demounting Tube-type Truck/Bus Tires" and "Multi-Piece Rim/Wheel Matching Chart," or other publications containing the same instructions, safety precautions and other information as are contained on those charts.

(c) *Employee training.* (1) Where an employer services multi-piece rim wheels, the employer shall provide a training program to educate employees to recognize and deal with the hazards involved with servicing multi-piece rim wheels and the safety procedures to be followed.

(i) The employer shall assure that no employee services any multi-piece rim wheel without being trained and instructed in correct mounting, demounting, maintenance, and safety precautions for the rim type being serviced and in the procedure described in paragraph (f) of this section.

(ii) Information to be employed in the training program shall include, but not necessarily be limited to, the data contained on the DOT wall charts and the contents of this standard.

(iii) Where an employer knows or has reason to believe that one of his emloyees is unable to read or understand the wall chart or rim manual, he shall instruct him orally about their contents.

(2) The employer shall assure that each employee demonstrates his ability to service safely wheels containing a multi-piece rim before that employee is permitted to perform this service by himself. The demonstration shall include the following tasks:

(i) Deflation and demounting of wheels;

(ii) Inspection of rims, lock rings and tires;

(iii) Mounting and inflation of wheels;

(iv) Use of restraining devices;

(v) Handling of inflated wheels;

(vi) Installation of inflated wheels on axles;

(vii) Removal of wheels; and

(viii) Inflation of tires installed on vehicle.

(d) *Tire servicing equipment.* (1) The employer shall furnish a restraining device and shall assure that employees use the restraining device in servicing multipiece rim wheels.

(i) Tires shall be inflated only when contained by a restraining device, with the following exceptions:

(*a*) when the wheel assembly is installed on a vehicle, tires may be inflated without a restraining device if remote control inflation equipment is used and no employees are in the trajectory path; or

(*b*) when the lock ring is being seated, tires may be partially inflated as provided in paragraph (f)(4) of this section.

(ii) Each restraining device shall have the capacity to withstand the force that would be transferred to it during an explosive wheel separation occuring at 150% of maximum tire specification pressure for the largest wheel that the device can hold.

(iii) Restraining devices shall be capable of preventing rim components from being hurled outside or beyond the frame of the device for any wheel position within the device.

(iv) Use of any restraining device having cracks in welds or components is prohibited.

(v) Damaged restraining devices shall be removed from service.

(2) A clip-on chuck, a sufficient length of hose to permit the attending mechanic to stand clear of the trajectory path, and an in-line, manually-operated valve with gauge or a pressure regulator preset to a desired value shall be used to inflate tires.

(3) Current wall charts shall be posted at a prominent place in the service area.

(4) A current rim manual containing mounting instructions for the type of rims being serviced by shop employees shall be available to employees in the service area.

(5) Proper tools shall be used to repair or service wheels.

(6) Rubber lubricant shall be available in the service area.

(e) *Wheel component acceptability.* (1) Wheel components shall not be interchanged except as provided for in the DOT "Multi-Piece Rim/Wheel Matching Chart."

(2) Side and lock rings which are bent out of shape, corroded, excessively worn, broken or cracked shall not be used and shall be removed from the service area.

(3) Mating surfaces of the rim gutter, rings and tire shall be free of any surface rust, scale or rubber build-up prior to mounting and inflation.

(f) *Safe operating procedure.* The employer shall establish a safe operating procedure for servicing multi-piece wheels and assure that employees are instructed in and follow that procedure. The procedure shall include, but not be limited to the following elements:

(1) Tires shall be completely deflated before being demounted.

(2) Tires that have been driven underinflated shall be deflated to 10 pounds per square inch gauge (psig) or less before removed from the vehicle axle.

(3) Rubber lubricant shall be applied to bead and rim mating surfaces for assembly and inflation of the wheel.

(4) When a tire is partially inflated without a restraining device for the sole purpose of seating the lock ring, air pressure shall not exceed 10 psig.

(5) Whenever a tire is in a restraining device during inflation, the employee

shall not rest or lean any part of his body or equipment on or against the restraining device.

(6) After tire inflation, the tire, rim and ring(s) shall be inspected while still within the restraining device to make sure that they are properly seated and locked. If futher adjustment to the tire, rim or ring(s) is necessary, the tire shall be deflated before making the adjustments.

(7) No attempt shall be made to correct the seating of side and lock ring(s) by hammering or forcing the components while the tire is pressurized.

(8) Whenever high temperature heat, e.g., from a welding torch, is applied to any part of a rim base, rings or lugs, either on or off the vehicle, the tire shall first be completely deflated.

(9) Inflated wheels being moved or stored in a service area shall be positioned such that the trajectory path of a lock ring will not pass through an area normally occupied by employees.

(10) Tires shall be deflated prior to being removed from a vehicle axle and no employees are to be in the trajectory path during such deflation.

BILLING CODE 4510-26-M

# APPENDIX A
# TRAJECTORY PATHS

**WARNING**

**ALWAYS STAY OUT OF THE TRAJECTORY PATH AS INDICATED BY SHADED AREA**

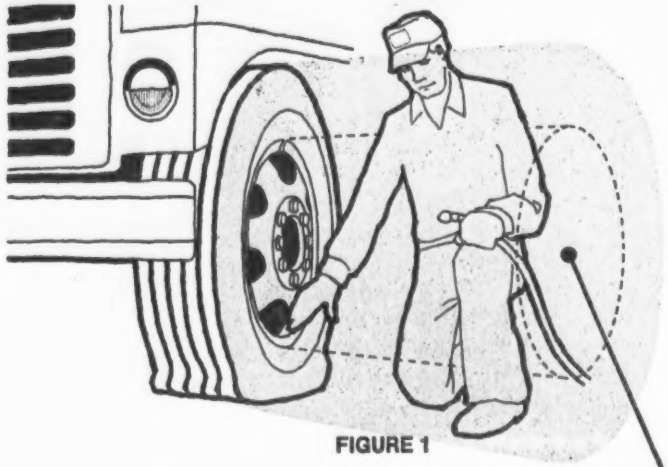

FIGURE 1

FIGURE 2

TRAJECTORY PATH

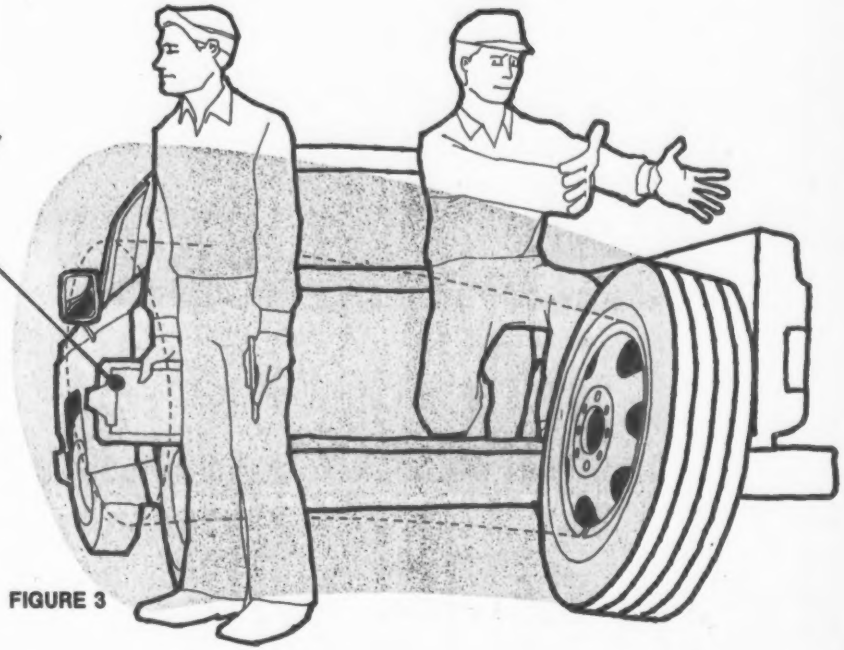

FIGURE 3

BILLING CODE 4510-26-C

**Appendix B—Wall Charts Ordering Information**

NHTSA has prepared safety information charts as part of a continuing campaign to alert truck and bus service personnel to the hazards involved when working with multi-piece wheels.

One of the charts, called the "Safety Chart," illustrates the proper safety precautions to be followed when servicing multi-piece truck and bus wheels. The companion "Matching Chart" provides guidance on the various wheel makes and components that can be safely interchanged. These charts are available to all persons who service multi-piece truck and bus wheels.

Individuals who service such wheels may obtain a single copy of each chart, without cost, by writing to the General Services Division/Distribution, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

Service establishments and other organizations desiring these charts may order them in any quantity desired from the Superintendent of Documents, Government Printing Office (GPO), Washington, D.C. 20402, at a cost established by the GPO. GPO ordering number for the charts are:

Safety Chart—050–003–0315–8, Cost: $2.25.
Matching Chart—050–003–00316—6, Cost: $2.00

(Sec. 84 Stat. 1593 (29 U.S.C. 655); Secretary of Labor's Order 8–76 (41 FR 25059), 29 CFR Part 1911.)

[Docket No. S–005]

[FR Doc. 79–12758 Filed 4–23–79; 8:45 am]

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## AGENCY PUBLICATION ON ASSIGNED DAYS OF THE WEEK

The following agencies have agreed to publish all documents on two assigned days of the week (Monday/Thursday or Tuesday/Friday).

This is a voluntary program. (See OFR NOTICE FR 32914, August 6, 1976.)

| Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|
| DOT/COAST GUARD | USDA/ASCS | | DOT/COAST GUARD | USDA/ASCS |
| DOT/NHTSA | USDA/APHIS | | DOT/NHTSA | USDA/APHIS |
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| DOT/OHMO | USDA/FSQS | | DOT/OHMO | USDA/FSQS |
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| CSA | MSPB*/OPM* | | CSA | MSPB*/OPM* |
| | LABOR | | | LABOR |
| | HEW/FDA | | | HEW/FDA |

Documents normally scheduled for publication on a day that will be a Federal holiday will be published the next work day following the holiday.

Comments on this program are still invited. Comments should be submitted to the Day-of-the-Week Program Coordinator, Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D.C. 20408

***NOTE: As of January 1, 1979, the Merit Systems Protection Board (MSPB) and the Office of Personnel Management (OPM) will publish on the Tuesday/Friday schedule. (MSPB and OPM are successor agencies to the Civil Service Commission.)**

## Rules Going Into Effect Today

**Note: There were no items eligible for inclusion in the list of Rules Going Into Effect Today.**

## List of Public Laws

This is a continuing list of public bills from the current session of Congress which have become Federal laws. The text of laws is not published in the Federal Register but may be ordered in individual pamphlet form (referred to as "slip laws") from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (telephone 202–375–3030).

**H. J. Res. 283 / Pub. L. 96–9** Reaffirming the United States commitment of the North Atlantic Alliance. (Apr. 19, 1979; 93 Stat. 22) Price $.60.

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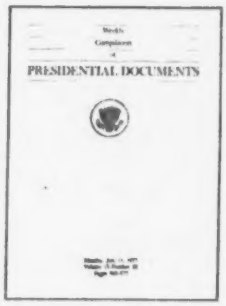


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